



Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-40475-1
Laboratory Sample Delivery Group: GJ46599769
Client Project/Site: HPNS-Parcel G 501197
Revision: 1

For:
Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Rose Condit

Rhonda Ridenhower

Authorized for release by:
4/12/2021 12:26:49 PM
Rhonda Ridenhower, Client Service Manager
(314)298-8566
Rhonda.Ridenhower@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Job ID: 160-40475-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Aptim Federal Services LLC

Project: HPNS-Parcel G 501197

Report Number: 160-40475-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an ""as received"" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

The matrix for the Method Blank and LCS is as close to the following samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

Revision 1- Additional information requested in case narrative for total strontium

Case Narrative

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Job ID: 160-40475-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

RECEIPT

The samples were received on 11/19/2020; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 13.5 C.

The incorrect sample was logged for strontium 90 analysis per the COC. The client was notified and accepted the analyzed sample. HPPG-ESU-TU079A-010 (160-40475-10).

STRONTIUM-90 (GFPC)

Samples HPPG-ESU-TU079A-001 (160-40475-1), HPPG-ESU-TU079A-010 (160-40475-10) and HPPG-ESU-TU079A-021 (160-40475-21) were analyzed for Strontium-90 (GFPC) in accordance with EPA 905. The samples were dried on 11/20/2020, prepared on 12/01/2020 and analyzed on 12/10/2020.

When taking small mass aliquots from dried/disaggregated sample, the laboratory avoids large rocks/pebbles (as well as sticks, etc) which may constitute a larger than representative portion of the aliquot. Smaller rocks may be included. This is consistent with QSM and Laboratory SOP: HPPG-ESU-TU079A-001 (160-40475-1), HPPG-ESU-TU079A-010 (160-40475-10) and HPPG-ESU-TU079A-021 (160-40475-21).

The method blank (MB) Z-score is within limits and is located in the level IV raw data (MB 160-490603/21-A)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples HPPG-ESU-TU079A-001 (160-40475-1), HPPG-ESU-TU079A-002 (160-40475-2), HPPG-ESU-TU079A-003 (160-40475-3), HPPG-ESU-TU079A-004 (160-40475-4), HPPG-ESU-TU079A-005 (160-40475-5), HPPG-ESU-TU079A-006 (160-40475-6), HPPG-ESU-TU079A-007 (160-40475-7), HPPG-ESU-TU079A-008 (160-40475-8), HPPG-ESU-TU079A-009 (160-40475-9), HPPG-ESU-TU079A-010 (160-40475-10), HPPG-ESU-TU079A-011 (160-40475-11), HPPG-ESU-TU079A-012 (160-40475-12), HPPG-ESU-TU079A-013 (160-40475-13), HPPG-ESU-TU079A-014 (160-40475-14), HPPG-ESU-TU079A-015 (160-40475-15), HPPG-ESU-TU079A-016 (160-40475-16), HPPG-ESU-TU079A-017 (160-40475-17), HPPG-ESU-TU079A-018 (160-40475-18), HPPG-ESU-TU079A-019 (160-40475-19), HPPG-ESU-TU079A-020 (160-40475-20), HPPG-ESU-TU079A-021 (160-40475-21), HPPG-ESU-TU079A-022 (160-40475-22), HPPG-ESU-TU079A-023 (160-40475-23), HPPG-ESU-TU079A-024 (160-40475-24), HPPG-ESU-TU079A-025 (160-40475-25), HPPG-F-039 (160-40475-26) and HPPG-F-040 (160-40475-27) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 11/20/2020, prepared on 11/24/2020 and analyzed on 12/15/2020.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from Reported to Analyte

Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223

Case Narrative

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Job ID: 160-40475-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

Gamma prep batch 490116

The method blank (MB) Z-score is within limits and is located in the level IV raw data (MB 160-490116/1-A)

The Radium-226 detection goal of 0.200 pCi/g was not met for the method blank (MB). This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline. (MB 160-490116/1-A)

The following sample exhibited a negative result greater in magnitude than the 3 sigma TPU for Th-234/U-238:(160-40480-A-6-B). This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required.

Gamma Prep Batch 490107

The method blank (MB) Z-score is within limits and is located in the level IV raw data (MB 160-490107/1-A)

Gamma prep batch 490110

The method blank (MB) z-score associated with Prep Batch 160-490110 is within limits and is stored in the level IV raw data. (MB 160-490110/1-A)

The cesium-137 detection goal of 0.0700 pCi/g was not met. This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline.

HPPG-ESU-TU079A-013 (160-40475-13)

The following sample exhibited a negative result greater in magnitude than the 3 sigma TPU for Th-234: HPPG-ESU-TU079A-011 (160-40475-11). This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



CHAIN OF CUSTODY

Ref. Document # 501197RSY-035

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APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Bercik
Phone #: (619)213-3389Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy

Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murri
Paul LeBlanc

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Project Number:	Analysis Requested				Barcode	Comment
	Standard-90 (EPA 905 M0D)	Standard-90 (EPA 905 M0D - Full 21 day ingrowth gamma)	Standard-90 (EPA 905 M0D - Full 21 day ingrowth gamma)	Standard-90 (EPA 905 M0D - Full 21 day ingrowth gamma)		
501197						
Hunters Point Naval Shipyard: Parcel G Remedial Action						
Project Location: San Francisco, CA						
Purchase Order #: 1159058						
Shipment/Pickup Date: 11/18/2020						
Waybill Number: 4457 0225 6310						
Test America (St. Louis Lab) 13715 Rider Trail North Earth City, MO 63046						
Lab Destination:						
Lab Contact Name/ph #	Rhoeda Ridenbower (314)298-8566					
	Preservatives (water)					
	Preservatives (soil)					
Sample ID	Date	Time	Method	Matrix	# of Containers	
HPPG-ESU-TU079A-001	11/18/2020	10:38	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-002	11/18/2020	10:40	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-003	11/18/2020	10:43	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-004	11/18/2020	10:46	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-005	11/18/2020	10:49	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-006	11/18/2020	10:52	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-007	11/18/2020	10:55	G	SO	1	16 oz. plastic jar X X 4 GJ46599769
HPPG-ESU-TU079A-008	11/18/2020	10:58	G	SO	1	16 oz. plastic jar X X 4 GJ46599769

Special Instructions:

21 day ingrowth results only

Turnaround Time:	3-day <input type="checkbox"/>	10-Day <input type="checkbox"/>	28-day <input type="checkbox"/>	Other <input type="checkbox"/>	Level of QC Required:	I <input type="checkbox"/>	II <input type="checkbox"/>	III <input type="checkbox"/>	Project Specific
Method Codes C = Composite G = Grab Matrix Codes: DW = Drinking Water ; So = Soil; GW = Ground Water; SL = Sludge; WW = Waste Water; CP = Chip Samples; A = Air; ABS = Asbestos; PO = Pipe Opening									

Relinquished By:

Relinquisher Signature:

Relinquish Date Time:

Received By:

Received Signature:

Receive Date Time:

Lewis, Devin		11/18/2020 14:06	SHIPPEDTOLAB		11/18/2020 09:15
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*** Last 3 transfers shown above - Complete list of transfers on last page ***



ED_006360A_00000342-00006



CHAIN OF CUSTODY

Ref. Document # 501197RSY-035

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APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Bercik
Phone #: (619)213-3389Send Report to: Rose Condl
Phone/Fax Number: 415-987-0780
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520

Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murri
Paul LeBlanc

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4/12/2021 (Rev. 1)

				Analysis Requested						
				Shodium-90 (EP-A 905 MDD)				Dose Rate uR/Hr	Evidence Bag ID	Comment
				Sample Spec (EP-A 901.1M) - Full 21	Day in Month Sampling					
				Shodium-90 (EP-A 905 MDD)						
				Sample Spec (EP-A 901.1M) - Full 21	Day in Month Sampling					
Sample ID	Date	Time	Method	Matrix	# of Containers	Preservatives (water)	Preservatives (soil)	Container Type		
HPPG-ESU-TU079A-009	11/18/2020	11:01	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-010	11/18/2020	11:04	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-011	11/18/2020	11:07	G	SO	1	16 oz. plastic jar	X	X		4 GJ46599769
HPPG-ESU-TU079A-012	11/18/2020	11:10	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-013	11/18/2020	11:11	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-014	11/18/2020	11:13	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-015	11/18/2020	11:15	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-016	11/18/2020	11:17	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-017	11/18/2020	11:19	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-018	11/18/2020	11:20	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-019	11/18/2020	11:22	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-020	11/18/2020	11:24	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-021	11/18/2020	11:21	G	SO	1	16 oz. plastic jar	X	X		4 GJ46599769
HPPG-ESU-TU079A-022	11/18/2020	11:18	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-023	11/18/2020	11:16	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-024	11/18/2020	11:25	G	SO	1	16 oz. plastic jar	X			4 GJ46599769
HPPG-ESU-TU079A-025	11/18/2020	11:30	G	SO	1	16 oz. plastic jar	X			4 GJ46599769



CHAIN OF CUSTODY

Ref. Document # 501197RSY-035

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APTM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520

Project Manager: Lisa Bercik
Phone #: (619)213-3389

Send Report to: Rose Condit
Phone/fax Number: 415-987-9780
Address: 4005 Perl Chicago Hwy
City: Concord, CA 94520

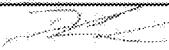
Sample Lead: Lewis, Devin

Sample Tech(s): Andrew Murray
Paul LeBlanc

Project Number:			Analysis Requested							
Hunters Point Naval Shipyard: Parcel G Remedial Action										
Project Location:			San Francisco, CA							
Purchase Order #:			1159058							
Shipment/Pickup Date:			11/18/2020							
Waybill Number:			4457 0225 6370							
Lab Destination:			Test America (St. Louis Lab) 13715 Rider Trail North Earth City, MO 63046							
Lab Contact Name/ph #			Rhoeda Ridenbower (314)298-8566							
Collection Information			Matrix	# of Containers	Preservatives (water)		Strontium-90 (EPA 905 MOD)	Dose Rate uR/Hr	Evidence Bag ID	Comment
Time		Method			Preservatives (soil)					
					Container Type					
20	10:40	G	SO	1	16 oz. plastic jar		X		4	GJ46599769
20	11:01	G	SO	1	16 oz. plastic jar		X		4	GJ46599769

All Transfers for COC 501197RSY-035

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Relinquished By:	Relinquisher Signature:	Relinquish Date Time:	Received By:	Received Signature:	Receive Date Time:
Lewis, Devin		11/18/2020 14:08	SHIPPEDTOLAB		11/19/2020 09:15

Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-40475-1

SDG Number: GJ46599769

Login Number: 40475

List Source: Eurofins TestAmerica, St. Louis

List Number: 1

Creator: Greer, Diane A

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Qualifiers

Rad Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
%	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Method	Method Description	Protocol	Laboratory
905	Strontium-90 (GFPC)	EPA	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
DPS-7	Preparation, Digestion/Precipitate Separation (7-Day In-Growth)	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-40475-1	HPPG-ESU-TU079A-001	Solid	11/18/20 10:38	11/19/20 09:15	
160-40475-2	HPPG-ESU-TU079A-002	Solid	11/18/20 10:40	11/19/20 09:15	
160-40475-3	HPPG-ESU-TU079A-003	Solid	11/18/20 10:43	11/19/20 09:15	
160-40475-4	HPPG-ESU-TU079A-004	Solid	11/18/20 10:46	11/19/20 09:15	
160-40475-5	HPPG-ESU-TU079A-005	Solid	11/18/20 10:49	11/19/20 09:15	
160-40475-6	HPPG-ESU-TU079A-006	Solid	11/18/20 10:52	11/19/20 09:15	
160-40475-7	HPPG-ESU-TU079A-007	Solid	11/18/20 10:55	11/19/20 09:15	
160-40475-8	HPPG-ESU-TU079A-008	Solid	11/18/20 10:58	11/19/20 09:15	
160-40475-9	HPPG-ESU-TU079A-009	Solid	11/18/20 11:01	11/19/20 09:15	
160-40475-10	HPPG-ESU-TU079A-010	Solid	11/18/20 11:04	11/19/20 09:15	
160-40475-11	HPPG-ESU-TU079A-011	Solid	11/18/20 11:07	11/19/20 09:15	
160-40475-12	HPPG-ESU-TU079A-012	Solid	11/18/20 11:10	11/19/20 09:15	
160-40475-13	HPPG-ESU-TU079A-013	Solid	11/18/20 11:11	11/19/20 09:15	
160-40475-14	HPPG-ESU-TU079A-014	Solid	11/18/20 11:13	11/19/20 09:15	
160-40475-15	HPPG-ESU-TU079A-015	Solid	11/18/20 11:15	11/19/20 09:15	
160-40475-16	HPPG-ESU-TU079A-016	Solid	11/18/20 11:17	11/19/20 09:15	
160-40475-17	HPPG-ESU-TU079A-017	Solid	11/18/20 11:19	11/19/20 09:15	
160-40475-18	HPPG-ESU-TU079A-018	Solid	11/18/20 11:20	11/19/20 09:15	
160-40475-19	HPPG-ESU-TU079A-019	Solid	11/18/20 11:22	11/19/20 09:15	
160-40475-20	HPPG-ESU-TU079A-020	Solid	11/18/20 11:24	11/19/20 09:15	
160-40475-21	HPPG-ESU-TU079A-021	Solid	11/18/20 11:21	11/19/20 09:15	
160-40475-22	HPPG-ESU-TU079A-022	Solid	11/18/20 11:18	11/19/20 09:15	
160-40475-23	HPPG-ESU-TU079A-023	Solid	11/18/20 11:16	11/19/20 09:15	
160-40475-24	HPPG-ESU-TU079A-024	Solid	11/18/20 11:25	11/19/20 09:15	
160-40475-25	HPPG-ESU-TU079A-025	Solid	11/18/20 11:30	11/19/20 09:15	
160-40475-26	HPPG-F-039	Solid	11/18/20 10:40	11/19/20 09:15	
160-40475-27	HPPG-F-040	Solid	11/18/20 11:01	11/19/20 09:15	

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-001

Lab Sample ID: 160-40475-1

Date Collected: 11/18/20 10:38

Matrix: Solid

Date Received: 11/19/20 09:15

Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Strontium-90	0.334		0.184	0.186	0.331	0.127	pCi/g	12/01/20 10:36	12/10/20 17:50	1
<i>Carrier</i>	%Yield	Qualifier	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Sr Carrier	95.3		40 - 110					12/01/20 10:36	12/10/20 17:50	1
Y Carrier	93.5		40 - 110					12/01/20 10:36	12/10/20 17:50	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.659		0.224	0.234		0.0674	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Actinium-227	0.188	U	0.361	0.362		0.322	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Bismuth-212	0.321	U	0.608	0.609		0.463	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Bismuth-214	0.217		0.0994	0.102		0.211	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Cesium-137	0.0256	U	0.0700	0.0701	0.0700	0.0556	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Lead-210	2.13		1.55	1.58		0.940	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Lead-212	0.374		0.0891	0.0973		0.0455	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Lead-214	0.415		0.122	0.129		0.0528	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Potassium-40	7.87		1.26	1.49		0.117	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Protactinium-231	0.000	U	0.397	0.397		2.34	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Protactinium-234	0.0825	U	0.250	0.250		0.241	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Radium-226	0.217		0.0994	0.102	0.200	0.211	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Radium-228	0.659		0.224	0.234		0.0674	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Thallium-208	0.121		0.0672	0.0683		0.0311	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Thorium 228	0.374		0.0891	0.0973		0.0455	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Thorium-232	0.659		0.224	0.234		0.0674	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Thorium-234	1.01		0.737	0.745		0.436	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Uranium-235	0.00630	U	0.00879	0.00881		0.224	pCi/g	11/24/20 14:25	12/15/20 08:15	1
Uranium-238	1.01		0.737	0.745		0.436	pCi/g	11/24/20 14:25	12/15/20 08:15	1

Client Sample ID: HPPG-ESU-TU079A-002

Lab Sample ID: 160-40475-2

Date Collected: 11/18/20 10:40

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.703		0.191	0.204		0.0355	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Actinium-227	0.199	U	0.389	0.390		0.299	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Bismuth-212	1.06		0.452	0.465		0.112	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Bismuth-214	0.491		0.125	0.134		0.0372	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Cesium-137	-0.0295	U	0.0642	0.0643	0.0700	0.0499	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Lead-210	-0.573	U	2.01	2.01		1.67	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Lead-212	0.498		0.0933	0.107		0.0415	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Lead-214	0.484		0.111	0.121		0.0544	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Potassium-40	8.45		1.48	1.71		0.215	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Protactinium-231	0.000	U	0.458	0.458		2.26	pCi/g	11/24/20 14:25	12/15/20 09:07	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-002

Lab Sample ID: 160-40475-2

Date Collected: 11/18/20 10:40

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Protactinium-234	0.116	U	0.308	0.308		0.221	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Radium-226	0.491		0.125	0.134	0.200	0.0372	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Radium-228	0.703		0.191	0.204		0.0355	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Thallium-208	0.203		0.0537	0.0575		0.00829	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Thorium 228	0.498		0.0933	0.107		0.0415	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Thorium-232	0.703		0.191	0.204		0.0355	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Thorium-234	0.505		0.576	0.579		0.402	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Uranium-235	0.0116	U	0.0142	0.0143		0.427	pCi/g	11/24/20 14:25	12/15/20 09:07	1
Uranium-238	0.505		0.576	0.579		0.402	pCi/g	11/24/20 14:25	12/15/20 09:07	1

Client Sample ID: HPPG-ESU-TU079A-003

Lab Sample ID: 160-40475-3

Date Collected: 11/18/20 10:43

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.571		0.138	0.150		0.0209	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Actinium-227	0.159	U	0.488	0.488		0.285	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Bismuth-212	0.295	U	0.599	0.599		0.469	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Bismuth-214	0.317		0.0893	0.0952		0.0418	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Cesium-137	-0.0179	U	0.0484	0.0484	0.0700	0.0384	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Lead-210	0.547	U	1.05	1.05		0.836	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Lead-212	0.458		0.0758	0.0962		0.0326	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Lead-214	0.351		0.0859	0.0933		0.0394	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Potassium-40	8.18		1.12	1.39		0.234	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Protactinium-231	0.000	U	0.395	0.395		1.63	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Protactinium-234	0.0258	U	0.0431	0.0432		0.196	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Radium-226	0.317		0.0893	0.0952	0.200	0.0418	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Radium-228	0.571		0.138	0.150		0.0209	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Thallium-208	0.0714		0.0695	0.0699		0.0363	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Thorium 228	0.458		0.0758	0.0962		0.0326	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Thorium-232	0.571		0.138	0.150		0.0209	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Thorium-234	0.203	U	0.436	0.437		0.779	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Uranium-235	0.0438	U	0.217	0.217		0.357	pCi/g	11/24/20 15:38	12/15/20 12:14	1
Uranium-238	0.203	U	0.436	0.437		0.779	pCi/g	11/24/20 15:38	12/15/20 12:14	1

Client Sample ID: HPPG-ESU-TU079A-004

Lab Sample ID: 160-40475-4

Date Collected: 11/18/20 10:46

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.467		0.256	0.260		0.104	pCi/g	11/24/20 15:38	12/15/20 09:11	1
Actinium-227	-0.152	U	0.602	0.602		0.367	pCi/g	11/24/20 15:38	12/15/20 09:11	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-004
 Date Collected: 11/18/20 10:46
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-4
 Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Bismuth-212	0.431	U		0.728	0.730		0.553	pCi/g	11/24/20 15:38	12/15/20 09:11
Bismuth-214	0.474			0.158	0.165		0.0687	pCi/g	11/24/20 15:38	12/15/20 09:11
Cesium-137	0.0198	U		0.0470	0.0471	0.0700	0.0360	pCi/g	11/24/20 15:38	12/15/20 09:11
Lead-210	1.89			1.73	1.74		1.05	pCi/g	11/24/20 15:38	12/15/20 09:11
Lead-212	0.555			0.107	0.122		0.0489	pCi/g	11/24/20 15:38	12/15/20 09:11
Lead-214	0.440			0.133	0.140		0.0618	pCi/g	11/24/20 15:38	12/15/20 09:11
Potassium-40	7.96			1.32	1.55		0.128	pCi/g	11/24/20 15:38	12/15/20 09:11
Protactinium-231	-0.881	U		2.92	2.92		2.38	pCi/g	11/24/20 15:38	12/15/20 09:11
Protactinium-234	0.0134	U		0.254	0.254		0.208	pCi/g	11/24/20 15:38	12/15/20 09:11
Radium-226	0.474			0.158	0.165	0.200	0.0687	pCi/g	11/24/20 15:38	12/15/20 09:11
Radium-228	0.467			0.256	0.260		0.104	pCi/g	11/24/20 15:38	12/15/20 09:11
Thallium-208	0.227			0.0698	0.0735		0.0189	pCi/g	11/24/20 15:38	12/15/20 09:11
Thorium 228	0.555			0.107	0.122		0.0489	pCi/g	11/24/20 15:38	12/15/20 09:11
Thorium-232	0.467			0.256	0.260		0.104	pCi/g	11/24/20 15:38	12/15/20 09:11
Thorium-234	0.444	U		0.558	0.560		0.493	pCi/g	11/24/20 15:38	12/15/20 09:11
Uranium-235	0.0721	U		0.262	0.262		0.461	pCi/g	11/24/20 15:38	12/15/20 09:11
Uranium-238	0.444	U		0.558	0.560		0.493	pCi/g	11/24/20 15:38	12/15/20 09:11

Client Sample ID: HPPG-ESU-TU079A-005

Date Collected: 11/18/20 10:49
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-5

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.541			0.131	0.142		0.0209	pCi/g	11/24/20 15:38	12/15/20 09:01
Actinium-227	0.131	U		0.276	0.276		0.266	pCi/g	11/24/20 15:38	12/15/20 09:01
Bismuth-212	0.000	U		0.328	0.329		0.506	pCi/g	11/24/20 15:38	12/15/20 09:01
Bismuth-214	0.382			0.108	0.115		0.0458	pCi/g	11/24/20 15:38	12/15/20 09:01
Cesium-137	0.0131	U		0.0286	0.0286	0.0700	0.0216	pCi/g	11/24/20 15:38	12/15/20 09:01
Lead-210	-0.420	U		1.16	1.16		0.932	pCi/g	11/24/20 15:38	12/15/20 09:01
Lead-212	0.432			0.0742	0.0930		0.0324	pCi/g	11/24/20 15:38	12/15/20 09:01
Lead-214	0.372			0.0811	0.0898		0.0434	pCi/g	11/24/20 15:38	12/15/20 09:01
Potassium-40	7.27			1.02	1.26		0.0826	pCi/g	11/24/20 15:38	12/15/20 09:01
Protactinium-231	-0.632	U		2.11	2.11		1.71	pCi/g	11/24/20 15:38	12/15/20 09:01
Protactinium-234	0.000779	U		0.00136	0.00137		0.195	pCi/g	11/24/20 15:38	12/15/20 09:01
Radium-226	0.382			0.108	0.115	0.200	0.0458	pCi/g	11/24/20 15:38	12/15/20 09:01
Radium-228	0.541			0.131	0.142		0.0209	pCi/g	11/24/20 15:38	12/15/20 09:01
Thallium-208	0.122			0.0403	0.0423		0.0132	pCi/g	11/24/20 15:38	12/15/20 09:01
Thorium 228	0.432			0.0742	0.0930		0.0324	pCi/g	11/24/20 15:38	12/15/20 09:01
Thorium-232	0.541			0.131	0.142		0.0209	pCi/g	11/24/20 15:38	12/15/20 09:01
Thorium-234	0.186	U		0.433	0.433		0.756	pCi/g	11/24/20 15:38	12/15/20 09:01
Uranium-235	-0.162	U		0.455	0.456		0.371	pCi/g	11/24/20 15:38	12/15/20 09:01
Uranium-238	0.186	U		0.433	0.433		0.756	pCi/g	11/24/20 15:38	12/15/20 09:01

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-006

Lab Sample ID: 160-40475-6

Date Collected: 11/18/20 10:52
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.563		0.196	0.206		0.0419	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Actinium-227	0.230	U	0.690	0.690		0.418	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Bismuth-212	0.000	U	0.496	0.496		0.734	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Bismuth-214	0.455		0.160	0.168		0.0644	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Cesium-137	-0.0545	U	0.0873	0.0875	0.0700	0.0667	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Lead-210	0.638	U	1.70	1.70		1.17	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Lead-212	0.479		0.119	0.132		0.0633	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Lead-214	0.611		0.168	0.182		0.0683	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Potassium-40	11.4		1.84	2.26		0.370	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Protactinium-231	-0.488	U	3.43	3.43		2.81	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Protactinium-234	0.0139	U	0.0257	0.0258		0.334	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Radium-226	0.455		0.160	0.168	0.200	0.0644	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Radium-228	0.563		0.196	0.206		0.0419	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Thallium-208	0.224		0.0779	0.0821		0.0283	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Thorium 228	0.479		0.119	0.132		0.0633	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Thorium-232	0.563		0.196	0.206		0.0419	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Thorium-234	0.452	U	0.738	0.740		0.577	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Uranium-235	-0.0281	U	0.396	0.396		0.592	pCi/g	11/24/20 15:38	12/15/20 09:06	1
Uranium-238	0.452	U	0.738	0.740		0.577	pCi/g	11/24/20 15:38	12/15/20 09:06	1

Client Sample ID: HPPG-ESU-TU079A-007

Lab Sample ID: 160-40475-7

Date Collected: 11/18/20 10:55
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.665		0.196	0.208		0.0368	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Actinium-227	0.142	U	0.389	0.389		0.351	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Bismuth-212	0.133	U	0.835	0.835		0.674	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Bismuth-214	0.644		0.144	0.159		0.0387	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Cesium-137	-0.0259	U	0.0764	0.0764	0.0700	0.0606	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Lead-210	0.848	U	1.47	1.48		0.980	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Lead-212	0.537		0.0973	0.112		0.0417	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Lead-214	0.513		0.142	0.151		0.0574	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Potassium-40	7.35		1.84	1.99		0.647	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Protactinium-231	0.000	U	0.651	0.651		2.30	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Protactinium-234	-0.0481	U	0.146	0.146		0.257	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Radium-226	0.644		0.144	0.159	0.200	0.0387	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Radium-228	0.665		0.196	0.208		0.0368	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Thallium-208	0.246		0.0638	0.0685		0.0132	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Thorium 228	0.537		0.0973	0.112		0.0417	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Thorium-232	0.665		0.196	0.208		0.0368	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Thorium-234	-0.496	U	0.968	0.970		0.810	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Uranium-235	0.0818	U	0.180	0.180		0.482	pCi/g	11/24/20 15:38	12/15/20 09:44	1
Uranium-238	-0.496	U	0.968	0.970		0.810	pCi/g	11/24/20 15:38	12/15/20 09:44	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-008
 Date Collected: 11/18/20 10:58
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-8
 Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.420		0.216	0.221		0.0896	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Actinium-227	0.220	U	0.479	0.479		0.287	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Bismuth-212	-0.0229	U	0.694	0.694		0.574	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Bismuth-214	0.419		0.101	0.110		0.0206	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Cesium-137	0.0234	U	0.0513	0.0514	0.0700	0.0399	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Lead-210	1.03		1.16	1.16		0.808	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Lead-212	0.411		0.0859	0.101		0.0406	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Lead-214	0.389		0.108	0.116		0.0558	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Potassium-40	9.12		1.34	1.63		0.294	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Protactinium-231	-0.791	U	2.30	2.30		1.87	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Protactinium-234	0.0665	U	0.0863	0.0865		0.181	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Radium-226	0.419		0.101	0.110	0.200	0.0206	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Radium-228	0.420		0.216	0.221		0.0896	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Thallium-208	0.202		0.0515	0.0556		0.0144	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Thorium 228	0.411		0.0859	0.101		0.0406	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Thorium-232	0.420		0.216	0.221		0.0896	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Thorium-234	0.480		0.450	0.453		0.324	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Uranium-235	0.0859	U	0.188	0.188		0.272	pCi/g	11/24/20 15:38	12/15/20 09:51	1
Uranium-238	0.480		0.450	0.453		0.324	pCi/g	11/24/20 15:38	12/15/20 09:51	1

Client Sample ID: HPPG-ESU-TU079A-009

Date Collected: 11/18/20 11:01
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-9

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.191	U	0.317	0.318		0.204	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Actinium-227	0.124	U	0.335	0.335		0.344	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Bismuth-212	0.0379	U	1.04	1.04		0.851	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Bismuth-214	0.485		0.183	0.190		0.0920	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Cesium-137	-0.0285	U	0.0768	0.0769	0.0700	0.0689	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Lead-210	0.338	U	1.42	1.42		0.998	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Lead-212	0.456		0.112	0.127		0.0552	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Lead-214	0.443		0.183	0.189		0.0935	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Potassium-40	8.59		1.93	2.12		0.546	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Protactinium-231	0.000	U	0.830	0.830		2.39	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Protactinium-234	-0.109	U	0.282	0.282		0.227	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Radium-226	0.485		0.183	0.190	0.200	0.0920	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Radium-228	0.191	U	0.317	0.318		0.204	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Thallium-208	0.228		0.0694	0.0733		0.0179	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Thorium 228	0.456		0.112	0.127		0.0552	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Thorium-232	0.191	U	0.317	0.318		0.204	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Thorium-234	0.528		0.538	0.541		0.461	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Uranium-235	-0.0120	U	0.318	0.318		0.314	pCi/g	11/24/20 15:38	12/15/20 09:43	1
Uranium-238	0.528		0.538	0.541		0.461	pCi/g	11/24/20 15:38	12/15/20 09:43	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-010
Date Collected: 11/18/20 11:04
Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-10
Matrix: Solid

Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Strontium-90	0.151		0.152	0.152	0.331	0.113	pCi/g	12/01/20 10:36	12/10/20 17:50	1
<i>Carrier</i>	%Yield	Qualifier	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Sr Carrier	101		40 - 110					12/01/20 10:36	12/10/20 17:50	1
Y Carrier	92.0		40 - 110					12/01/20 10:36	12/10/20 17:50	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.534		0.130	0.141		0.0245	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Actinium-227	0.0562	U	0.312	0.312		0.269	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Bismuth-212	0.295	U	0.532	0.533		0.406	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Bismuth-214	0.144	U	0.0854	0.0867		0.154	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Cesium-137	-0.0177	U	0.0631	0.0631	0.0700	0.0506	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Lead-210	-0.328	U	1.28	1.28		1.04	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Lead-212	0.501		0.0859	0.108		0.0370	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Lead-214	0.354		0.0906	0.0978		0.0398	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Potassium-40	8.71		1.25	1.54		0.274	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Protactinium-231	-0.837	U	2.63	2.63		2.14	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Protactinium-234	0.0320	U	0.140	0.140		0.208	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Radium-226	0.144	U	0.0854	0.0867	0.200	0.154	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Radium-228	0.534		0.130	0.141		0.0245	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Thallium-208	0.105		0.0862	0.0869		0.0405	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Thorium 228	0.501		0.0859	0.108		0.0370	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Thorium-232	0.534		0.130	0.141		0.0245	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Thorium-234	0.0385	U	0.0823	0.0825		0.904	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Uranium-235	0.000	U	0.0699	0.0699		0.355	pCi/g	11/24/20 15:38	12/15/20 09:32	1
Uranium-238	0.0385	U	0.0823	0.0825		0.904	pCi/g	11/24/20 15:38	12/15/20 09:32	1

Client Sample ID: HPPG-ESU-TU079A-011

Lab Sample ID: 160-40475-11

Date Collected: 11/18/20 11:07
Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.456		0.209	0.214		0.0719	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Actinium-227	0.178	U	0.511	0.511		0.344	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Bismuth-212	-0.308	U	0.921	0.922		0.734	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Bismuth-214	0.443		0.148	0.155		0.0824	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Cesium-137	0.0460	U	0.0860	0.0861	0.0700	0.0675	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Lead-210	1.15		1.37	1.38		0.934	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Lead-212	0.465		0.105	0.115		0.0554	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Lead-214	0.475		0.129	0.138		0.0756	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Potassium-40	10.1		1.47	1.79		0.125	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Protactinium-231	-0.893	U	3.06	3.06		2.49	pCi/g	11/24/20 15:38	12/15/20 09:47	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-011

Lab Sample ID: 160-40475-11

Date Collected: 11/18/20 11:07

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Protactinium-234	0.0428	U	0.205	0.205		0.268	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Radium-226	0.443		0.148	0.155	0.200	0.0824	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Radium-228	0.456		0.209	0.214		0.0719	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Thallium-208	0.207		0.0767	0.0795		0.0282	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Thorium 228	0.465		0.105	0.115		0.0554	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Thorium-232	0.456		0.209	0.214		0.0719	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Thorium-234	-1.06	U	0.695	0.705		0.973	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Uranium-235	0.156	U	0.420	0.420		0.380	pCi/g	11/24/20 15:38	12/15/20 09:47	1
Uranium-238	-1.06	U	0.695	0.705		0.973	pCi/g	11/24/20 15:38	12/15/20 09:47	1

Client Sample ID: HPPG-ESU-TU079A-012

Lab Sample ID: 160-40475-12

Date Collected: 11/18/20 11:10

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.434		0.127	0.134		0.0424	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Actinium-227	0.212	U	0.392	0.393		0.272	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Bismuth-212	0.347	U	0.631	0.632		0.491	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Bismuth-214	0.399		0.124	0.130		0.0516	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Cesium-137	-0.0235	U	0.0632	0.0632	0.0700	0.0505	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Lead-210	-0.712	U	1.54	1.54		1.24	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Lead-212	0.424		0.0740	0.0921		0.0304	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Lead-214	0.387		0.0893	0.0980		0.0457	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Potassium-40	10.6		1.26	1.66		0.0874	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Protactinium-231	0.000	U	0.466	0.466		1.84	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Protactinium-234	0.135	U	0.177	0.177		0.174	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Radium-226	0.399		0.124	0.130	0.200	0.0516	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Radium-228	0.434		0.127	0.134		0.0424	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Thallium-208	0.178		0.0610	0.0637		0.0213	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Thorium 228	0.424		0.0740	0.0921		0.0304	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Thorium-232	0.434		0.127	0.134		0.0424	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Thorium-234	0.627		0.369	0.375		0.253	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Uranium-235	-0.0161	U	0.0282	0.0282		0.386	pCi/g	11/24/20 15:38	12/15/20 09:33	1
Uranium-238	0.627		0.369	0.375		0.253	pCi/g	11/24/20 15:38	12/15/20 09:33	1

Client Sample ID: HPPG-ESU-TU079A-013

Lab Sample ID: 160-40475-13

Date Collected: 11/18/20 11:11

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.719		0.209	0.225		0.118	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Actinium-227	0.271	U	0.667	0.668		0.403	pCi/g	11/24/20 15:38	12/15/20 09:48	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-013
 Date Collected: 11/18/20 11:11
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-13
 Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Bismuth-212	-0.0346	U	0.813	0.813		0.666	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Bismuth-214	0.532		0.203	0.212		0.0862	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Cesium-137	-0.0189	U	0.102	0.102	0.0700	0.0829	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Lead-210	1.89		1.95	1.97		1.17	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Lead-212	0.554		0.113	0.130		0.0533	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Lead-214	0.599		0.162	0.176		0.0645	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Potassium-40	10.1		1.64	2.01		0.329	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Protactinium-231	0.593	U	2.47	2.47		2.60	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Protactinium-234	-0.00442	U	0.360	0.360		0.296	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Radium-226	0.532		0.203	0.212	0.200	0.0862	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Radium-228	0.719		0.209	0.225		0.118	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Thallium-208	0.226		0.0869	0.0907		0.0361	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Thorium 228	0.554		0.113	0.130		0.0533	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Thorium-232	0.719		0.209	0.225		0.118	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Thorium-234	0.319	U	0.288	0.290		0.937	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Uranium-235	0.0760	U	0.236	0.236		0.545	pCi/g	11/24/20 15:38	12/15/20 09:48	1
Uranium-238	0.319	U	0.288	0.290		0.937	pCi/g	11/24/20 15:38	12/15/20 09:48	1

Client Sample ID: HPPG-ESU-TU079A-014

Lab Sample ID: 160-40475-14

Date Collected: 11/18/20 11:13
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.485		0.179	0.185		0.184	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Actinium-227	0.000	U	0.314	0.314		0.376	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Bismuth-212	0.329	U	0.915	0.916		0.722	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Bismuth-214	0.606		0.159	0.170		0.0535	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Cesium-137	0.0113	U	0.0647	0.0647	0.0700	0.0361	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Lead-210	1.40		1.39	1.40		0.963	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Lead-212	0.566		0.100	0.116		0.0411	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Lead-214	0.658		0.150	0.164		0.0548	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Potassium-40	8.81		1.86	2.06		0.563	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Protactinium-231	0.000	U	0.718	0.718		2.37	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Protactinium-234	0.0250	U	0.0450	0.0450		0.263	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Radium-226	0.606		0.159	0.170	0.200	0.0535	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Radium-228	0.485		0.179	0.185		0.184	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Thallium-208	0.186		0.0632	0.0660		0.0206	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Thorium 228	0.566		0.100	0.116		0.0411	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Thorium-232	0.485		0.179	0.185		0.184	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Thorium-234	0.306	U	0.557	0.558		0.440	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Uranium-235	0.0879	U	0.193	0.193		0.479	pCi/g	11/24/20 15:38	12/15/20 10:35	1
Uranium-238	0.306	U	0.557	0.558		0.440	pCi/g	11/24/20 15:38	12/15/20 10:35	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-015

Lab Sample ID: 160-40475-15

Date Collected: 11/18/20 11:15
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.367		0.242	0.245		0.112	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Actinium-227	-0.0267	U	0.557	0.557		0.301	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Bismuth-212	-0.0498	U	0.760	0.760		0.613	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Bismuth-214	0.415		0.0993	0.108		0.0222	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Cesium-137	0.0116	U	0.0594	0.0594	0.0700	0.0480	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Lead-210	1.39		1.26	1.27		0.773	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Lead-212	0.422		0.0855	0.101		0.0432	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Lead-214	0.326		0.115	0.120		0.0539	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Potassium-40	8.29		1.21	1.48		0.264	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Protactinium-231	0.000	U	0.268	0.268		2.03	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Protactinium-234	0.0488	U	0.0741	0.0743		0.145	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Radium-226	0.415		0.0993	0.108	0.200	0.0222	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Radium-228	0.367		0.242	0.245		0.112	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Thallium-208	0.100		0.0568	0.0577		0.0281	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Thorium 228	0.422		0.0855	0.101		0.0432	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Thorium-232	0.367		0.242	0.245		0.112	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Thorium-234	-0.336	U	0.514	0.515		0.692	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Uranium-235	0.0788	U	0.192	0.192		0.241	pCi/g	11/24/20 15:38	12/15/20 10:38	1
Uranium-238	-0.336	U	0.514	0.515		0.692	pCi/g	11/24/20 15:38	12/15/20 10:38	1

Client Sample ID: HPPG-ESU-TU079A-016

Lab Sample ID: 160-40475-16

Date Collected: 11/18/20 11:17
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.405		0.247	0.251		0.0956	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Actinium-227	-0.0638	U	0.655	0.655		0.404	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Bismuth-212	0.417	U	0.813	0.814		0.615	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Bismuth-214	0.313		0.141	0.145		0.0777	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Cesium-137	-0.0127	U	0.0678	0.0678	0.0700	0.0571	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Lead-210	-0.343	U	1.60	1.60		1.15	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Lead-212	0.492		0.104	0.122		0.0410	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Lead-214	0.368		0.122	0.128		0.0849	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Potassium-40	7.69		1.58	1.77		0.302	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Protactinium-231	0.000	U	0.431	0.431		2.25	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Protactinium-234	0.0815	U	0.139	0.139		0.205	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Radium-226	0.313		0.141	0.145	0.200	0.0777	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Radium-228	0.405		0.247	0.251		0.0956	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Thallium-208	0.137		0.0886	0.0897		0.0451	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Thorium 228	0.492		0.104	0.122		0.0410	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Thorium-232	0.405		0.247	0.251		0.0956	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Thorium-234	0.545		0.587	0.590		0.445	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Uranium-235	0.199	U	0.283	0.283		0.253	pCi/g	11/24/20 15:38	12/15/20 10:16	1
Uranium-238	0.545		0.587	0.590		0.445	pCi/g	11/24/20 15:38	12/15/20 10:16	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-017

Lab Sample ID: 160-40475-17

Date Collected: 11/18/20 11:19
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.602		0.142	0.155		0.0253	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Actinium-227	0.188	U	0.140	0.142		0.355	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Bismuth-212	0.358	U	0.673	0.674		0.523	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Bismuth-214	0.346		0.103	0.109		0.0456	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Cesium-137	-0.00751	U	0.0455	0.0455	0.0700	0.0367	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Lead-210	-0.733	U		1.54	1.54	1.23	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Lead-212	0.498		0.0877	0.109		0.0385	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Lead-214	0.425		0.0940	0.104		0.0446	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Potassium-40	8.06		1.23	1.48		0.283	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Protactinium-231	0.597	U	1.68	1.68		1.84	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Protactinium-234	0.0181	U	0.0298	0.0299		0.227	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Radium-226	0.346		0.103	0.109	0.200	0.0456	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Radium-228	0.602		0.142	0.155		0.0253	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Thallium-208	0.135		0.0827	0.0839		0.0397	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Thorium 228	0.498		0.0877	0.109		0.0385	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Thorium-232	0.602		0.142	0.155		0.0253	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Thorium-234	0.378	U	0.608	0.610		0.837	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Uranium-235	0.0154	U	0.0234	0.0235		0.498	pCi/g	11/24/20 15:38	12/15/20 10:11	1
Uranium-238	0.378	U	0.608	0.610		0.837	pCi/g	11/24/20 15:38	12/15/20 10:11	1

Client Sample ID: HPPG-ESU-TU079A-018

Lab Sample ID: 160-40475-18

Date Collected: 11/18/20 11:20
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.676		0.178	0.191		0.0331	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Actinium-227	0.158	U	0.306	0.307		0.421	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Bismuth-212	0.353	U	0.916	0.917		0.725	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Bismuth-214	0.541		0.160	0.169		0.0660	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Cesium-137	0.00510	U	0.0689	0.0689	0.0700	0.0563	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Lead-210	-1.69	U	1.77	1.78		1.95	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Lead-212	0.556		0.171	0.181		0.121	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Lead-214	0.571		0.128	0.141		0.0461	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Potassium-40	9.04		1.41	1.68		0.128	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Protactinium-231	0.671	U	2.01	2.01		2.20	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Protactinium-234	0.134		0.136	0.137		0.0710	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Radium-226	0.541		0.160	0.169	0.200	0.0660	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Radium-228	0.676		0.178	0.191		0.0331	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Thallium-208	0.235		0.0660	0.0702		0.0164	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Thorium 228	0.556		0.171	0.181		0.121	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Thorium-232	0.676		0.178	0.191		0.0331	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Thorium-234	0.669		0.556	0.561		0.425	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Uranium-235	0.169	U	0.495	0.495		0.419	pCi/g	11/24/20 15:38	12/15/20 10:20	1
Uranium-238	0.669		0.556	0.561		0.425	pCi/g	11/24/20 15:38	12/15/20 10:20	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-019

Lab Sample ID: 160-40475-19

Date Collected: 11/18/20 11:22
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.263		0.178	0.180		0.0792	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Actinium-227	0.216	U	0.421	0.422		0.242	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Bismuth-212	-0.0520	U	0.548	0.548		0.447	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Bismuth-214	0.318		0.102	0.108		0.0433	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Cesium-137	-0.0320	U	0.0536	0.0537	0.0700	0.0418	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Lead-210	-0.328	U		1.22	1.22	0.991	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Lead-212	0.0245	U	0.0852	0.0852		0.0689	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Lead-214	0.354		0.0924	0.0995		0.0390	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Potassium-40	6.86		0.975	1.20		0.0807	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Protactinium-231	0.0000000	U		1.91	1.91	1.58	pCi/g	11/24/20 15:38	12/15/20 10:12	1
	561									
Protactinium-234	-0.0904	U	0.248	0.248		0.202	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Radium-226	0.318		0.102	0.108	0.200	0.0433	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Radium-228	0.263		0.178	0.180		0.0792	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Thallium-208	0.155		0.0364	0.0398		0.00500	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Thorium 228	0.0245	U	0.0852	0.0852		0.0689	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Thorium-232	0.263		0.178	0.180		0.0792	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Thorium-234	0.794		0.407	0.417		0.216	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Uranium-235	0.0854	U	0.152	0.152		0.383	pCi/g	11/24/20 15:38	12/15/20 10:12	1
Uranium-238	0.794		0.407	0.417		0.216	pCi/g	11/24/20 15:38	12/15/20 10:12	1

Client Sample ID: HPPG-ESU-TU079A-020

Lab Sample ID: 160-40475-20

Date Collected: 11/18/20 11:24
 Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.664		0.262	0.272		0.0844	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Actinium-227	0.00999	U	0.0225	0.0226		0.467	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Bismuth-212	0.275	U	0.742	0.742		0.578	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Bismuth-214	0.318		0.137	0.142		0.0619	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Cesium-137	0.0187	U	0.0562	0.0562	0.0700	0.0438	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Lead-210	0.928	U	1.87	1.87		1.21	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Lead-212	0.443		0.109	0.121		0.0585	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Lead-214	0.451		0.171	0.179		0.0764	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Potassium-40	8.72		1.54	1.84		0.333	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Protactinium-231	0.907	U	2.34	2.34		2.57	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Protactinium-234	0.0438	U	0.261	0.261		0.232	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Radium-226	0.318		0.137	0.142	0.200	0.0619	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Radium-228	0.664		0.262	0.272		0.0844	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Thallium-208	0.146		0.0830	0.0847		0.0384	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Thorium 228	0.443		0.109	0.121		0.0585	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Thorium-232	0.664		0.262	0.272		0.0844	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Thorium-234	-1.08	U	1.05	1.06		0.991	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Uranium-235	0.135	U	0.560	0.560		0.456	pCi/g	11/24/20 15:38	12/15/20 10:21	1
Uranium-238	-1.08	U	1.05	1.06		0.991	pCi/g	11/24/20 15:38	12/15/20 10:21	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-021

Lab Sample ID: 160-40475-21

Date Collected: 11/18/20 11:21
Date Received: 11/19/20 09:15

Matrix: Solid

Method: 905 - Strontium-90 (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Strontium-90	0.0942	U	0.144	0.144	0.331	0.111	pCi/g	12/01/20 10:36	12/10/20 17:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	105		40 - 110					12/01/20 10:36	12/10/20 17:30	1
Y Carrier	91.2		40 - 110					12/01/20 10:36	12/10/20 17:30	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.575		0.139	0.151		0.0339	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Actinium-227	0.0801	U	0.214	0.215		0.386	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Bismuth-212	0.0538	U	0.962	0.962		0.788	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Bismuth-214	0.521		0.148	0.158		0.0475	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Cesium-137	0.0181	U	0.0403	0.0403	0.0700	0.0303	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Lead-210	1.15		1.43	1.44		0.920	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Lead-212	0.418		0.0840	0.0946		0.0379	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Lead-214	0.458		0.109	0.119		0.0432	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Potassium-40	6.47		1.42	1.56		0.383	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Protactinium-231	0.219	U	2.55	2.55		2.09	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Protactinium-234	-0.0913	U	0.283	0.283		0.230	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Radium-226	0.521		0.148	0.158	0.200	0.0475	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Radium-228	0.575		0.139	0.151		0.0339	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Thallium-208	0.167		0.0487	0.0516		0.00792	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Thorium 228	0.418		0.0840	0.0946		0.0379	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Thorium-232	0.575		0.139	0.151		0.0339	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Thorium-234	0.222	U	0.473	0.474		0.409	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Uranium-235	-0.0330	U	0.277	0.277		0.432	pCi/g	11/24/20 15:38	12/15/20 11:36	1
Uranium-238	0.222	U	0.473	0.474		0.409	pCi/g	11/24/20 15:38	12/15/20 11:36	1

Client Sample ID: HPPG-ESU-TU079A-022

Lab Sample ID: 160-40475-22

Date Collected: 11/18/20 11:18
Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.530		0.166	0.175		0.0540	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Actinium-227	-0.0304	U	0.119	0.119		0.321	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Bismuth-212	0.196	U	0.722	0.723		0.577	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Bismuth-214	0.159	U	0.0883	0.0898		0.168	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Cesium-137	-0.00374	U	0.0510	0.0510	0.0700	0.0417	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Lead-210	0.203	U	1.35	1.35		0.933	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Lead-212	0.530		0.0981	0.120		0.0458	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Lead-214	0.498		0.111	0.122		0.0366	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Potassium-40	6.66		1.18	1.36		0.302	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Protactinium-231	-0.760	U	2.77	2.77		2.26	pCi/g	11/24/20 15:38	12/15/20 12:13	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-022

Lab Sample ID: 160-40475-22

Date Collected: 11/18/20 11:18
Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Protactinium-234	-0.00672	U	0.0164	0.0165		0.180	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Radium-226	0.159	U	0.0883	0.0898	0.200	0.168	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Radium-228	0.530		0.166	0.175		0.0540	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Thallium-208	0.147		0.0626	0.0644		0.0262	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Thorium 228	0.530		0.0981	0.120		0.0458	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Thorium-232	0.530		0.166	0.175		0.0540	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Thorium-234	-0.711	U	0.852	0.855		0.773	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Uranium-235	0.0945	U	0.208	0.208		0.276	pCi/g	11/24/20 15:38	12/15/20 12:13	1
Uranium-238	-0.711	U	0.852	0.855		0.773	pCi/g	11/24/20 15:38	12/15/20 12:13	1

Client Sample ID: HPPG-ESU-TU079A-023

Lab Sample ID: 160-40475-23

Date Collected: 11/18/20 11:16
Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.680		0.178	0.191		0.0321	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Actinium-227	-0.377	U	0.718	0.719		0.432	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Bismuth-212	1.44		0.509	0.530		0.105	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Bismuth-214	0.457		0.145	0.152		0.0649	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Cesium-137	0.0261	U	0.0552	0.0553	0.0700	0.0425	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Lead-210	1.32		1.32	1.33		0.880	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Lead-212	0.448		0.0993	0.110		0.0497	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Lead-214	0.393		0.121	0.127		0.0536	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Potassium-40	8.98		1.39	1.66		0.125	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Protactinium-231	0.000	U	0.519	0.519		2.35	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Protactinium-234	0.0955	U	0.243	0.243		0.196	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Radium-226	0.457		0.145	0.152	0.200	0.0649	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Radium-228	0.680		0.178	0.191		0.0321	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Thallium-208	0.175		0.0523	0.0552		0.0117	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Thorium 228	0.448		0.0993	0.110		0.0497	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Thorium-232	0.680		0.178	0.191		0.0321	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Thorium-234	0.806		0.532	0.539		0.446	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Uranium-235	-0.0582	U	0.130	0.130		0.502	pCi/g	11/24/20 16:52	12/15/20 10:56	1
Uranium-238	0.806		0.532	0.539		0.446	pCi/g	11/24/20 16:52	12/15/20 10:56	1

Client Sample ID: HPPG-ESU-TU079A-024

Lab Sample ID: 160-40475-24

Date Collected: 11/18/20 11:25
Date Received: 11/19/20 09:15

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Actinium 228	0.536		0.194	0.202		0.0838	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Actinium-227	-0.316	U	0.275	0.277		0.350	pCi/g	11/24/20 16:52	12/15/20 10:49	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-ESU-TU079A-024

Lab Sample ID: 160-40475-24

Date Collected: 11/18/20 11:25

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-212	-0.213	U	0.432	0.432		0.533	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Bismuth-214	0.400		0.121	0.128		0.0521	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Cesium-137	-0.0326	U	0.0527	0.0528	0.0700	0.0408	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Lead-210	-0.151	U	1.15	1.15		0.941	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Lead-212	0.422		0.0740	0.0920		0.0317	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Lead-214	0.373		0.103	0.110		0.0446	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Potassium-40	7.12		1.07	1.29		0.242	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Protactinium-231	-0.0000000	U	1.97	1.97		1.62	pCi/g	11/24/20 16:52	12/15/20 10:49	1
	199									
Protactinium-234	0.0164	U	0.0298	0.0298		0.188	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Radium-226	0.400		0.121	0.128	0.200	0.0521	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Radium-228	0.536		0.194	0.202		0.0838	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Thallium-208	0.132		0.0371	0.0395		0.0103	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Thorium 228	0.422		0.0740	0.0920		0.0317	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Thorium-232	0.536		0.194	0.202		0.0838	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Thorium-234	0.276	U	0.644	0.644		0.521	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Uranium-235	-0.148	U	0.396	0.397		0.322	pCi/g	11/24/20 16:52	12/15/20 10:49	1
Uranium-238	0.276	U	0.644	0.644		0.521	pCi/g	11/24/20 16:52	12/15/20 10:49	1

Client Sample ID: HPPG-ESU-TU079A-025

Lab Sample ID: 160-40475-25

Date Collected: 11/18/20 11:30

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.378		0.161	0.166		0.0400	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Actinium-227	0.243	U	0.376	0.378		0.291	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Bismuth-212	-0.00427	U	0.957	0.957		0.567	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Bismuth-214	0.380		0.160	0.165		0.0761	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Cesium-137	-0.00700	U	0.0619	0.0619	0.0700	0.0516	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Lead-210	0.834	U	1.31	1.32		0.892	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Lead-212	0.458		0.0972	0.114		0.0413	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Lead-214	0.367		0.160	0.164		0.0808	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Potassium-40	6.81		1.90	2.02		0.702	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Protactinium-231	0.557	U	1.75	1.75		1.41	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Protactinium-234	0.0616	U	0.102	0.102		0.186	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Radium-226	0.380		0.160	0.165	0.200	0.0761	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Radium-228	0.378		0.161	0.166		0.0400	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Thallium-208	0.229		0.0645	0.0687		0.0152	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Thorium 228	0.458		0.0972	0.114		0.0413	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Thorium-232	0.378		0.161	0.166		0.0400	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Thorium-234	0.159	U	0.478	0.478		0.380	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Uranium-235	-0.0994	U	0.257	0.257		0.339	pCi/g	11/24/20 16:52	12/15/20 10:52	1
Uranium-238	0.159	U	0.478	0.478		0.380	pCi/g	11/24/20 16:52	12/15/20 10:52	1

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Client Sample ID: HPPG-F-039
 Date Collected: 11/18/20 10:40
 Date Received: 11/19/20 09:15

Lab Sample ID: 160-40475-26
 Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.453		0.147	0.154		0.0263	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Actinium-227	0.167	U	0.295	0.295		0.279	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Bismuth-212	-0.493	U	0.666	0.668		0.685	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Bismuth-214	0.511		0.113	0.125		0.0240	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Cesium-137	-0.00706	U	0.0495	0.0495	0.0700	0.0401	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Lead-210	1.11		1.11	1.11		0.831	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Lead-212	0.414		0.0941	0.108		0.0522	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Lead-214	0.336		0.0965	0.103		0.0401	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Potassium-40	6.51		1.45	1.60		0.522	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Protactinium-231	0.000	U	0.289	0.289		2.03	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Protactinium-234	0.0354	U	0.0556	0.0558		0.175	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Radium-226	0.511		0.113	0.125	0.200	0.0240	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Radium-228	0.453		0.147	0.154		0.0263	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Thallium-208	0.194		0.0504	0.0543		0.0140	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Thorium 228	0.414		0.0941	0.108		0.0522	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Thorium-232	0.453		0.147	0.154		0.0263	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Thorium-234	-0.0464	U	0.850	0.850		0.701	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Uranium-235	0.000	U	0.208	0.208		0.272	pCi/g	11/24/20 16:52	12/15/20 12:49	1
Uranium-238	-0.0464	U	0.850	0.850		0.701	pCi/g	11/24/20 16:52	12/15/20 12:49	1

Client Sample ID: HPPG-F-040

Lab Sample ID: 160-40475-27

Date Collected: 11/18/20 11:01

Matrix: Solid

Date Received: 11/19/20 09:15

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.488		0.220	0.226		0.0760	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Actinium-227	0.241	U	0.468	0.469		0.297	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Bismuth-212	0.000	U	0.676	0.676		0.678	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Bismuth-214	0.521		0.143	0.153		0.0532	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Cesium-137	0.0325	U	0.0644	0.0645	0.0700	0.0497	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Lead-210	-1.02	U	1.97	1.97		1.65	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Lead-212	0.498		0.0873	0.102		0.0320	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Lead-214	0.348		0.105	0.111		0.0427	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Potassium-40	10.2		1.62	1.92		0.214	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Protactinium-231	-0.0118	U	2.71	2.71		2.23	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Protactinium-234	0.205		0.250	0.251		0.182	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Radium-226	0.521		0.143	0.153	0.200	0.0532	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Radium-228	0.488		0.220	0.226		0.0760	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Thallium-208	0.195		0.0594	0.0626		0.0178	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Thorium 228	0.498		0.0873	0.102		0.0320	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Thorium-232	0.488		0.220	0.226		0.0760	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Thorium-234	1.17		0.630	0.643		0.361	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Uranium-235	0.00680	U	0.0400	0.0401		0.374	pCi/g	11/24/20 16:52	12/15/20 12:11	1
Uranium-238	1.17		0.630	0.643		0.361	pCi/g	11/24/20 16:52	12/15/20 12:11	1

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Method: 905 - Strontium-90 (GFPC)

Lab Sample ID: MB 160-490603/21-A

Matrix: Solid

Analysis Batch: 491401

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490603

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Strontium-90	0.1284	U	0.224	0.224	0.331	0.175	pCi/g	12/01/20 10:36	12/10/20 17:33	1
Carrier										
Sr Carrier	MB	MB	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac	12/01/20 10:36	12/10/20 17:33
	83.7				40 - 110					
Y Carrier	MB	MB			40 - 110					
	87.1									

Lab Sample ID: LCS 160-490603/1-A

Matrix: Solid

Analysis Batch: 491432

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490603

Analyte	MB	MB	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec	%Rec. Limits
	Result	Qualifier									
Strontium-90	7.76		7.76	6.228		0.666	0.331	0.106	pCi/g	80	75 - 125
Carrier											
Sr Carrier	MB	MB	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac	12/01/20 10:36	12/10/20 17:33	1
	107				40 - 110						
Y Carrier	MB	MB			40 - 110						
	90.8										

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-490107/1-A

Matrix: Solid

Analysis Batch: 491759

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490107

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Actinium 228	-0.01402	U	0.196	0.196		0.106	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Actinium-227	0.04231	U	0.113	0.113		0.279	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Bismuth-212	-0.4221	U	0.832	0.834		0.628	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Bismuth-214	-0.1398	U	0.158	0.159		0.200	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Cesium-137	0.005444	U	0.0586	0.0586	0.0700	0.0475	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Lead-210	1.194		1.57	1.57		1.03	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Lead-212	-0.02147	U	0.0874	0.0874		0.0713	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Lead-214	0.01064	U	0.0952	0.0952		0.0761	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Potassium-40	-0.1884	U	1.69	1.69		0.298	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Protactinium-231	0.5326	U	1.59	1.59		1.26	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Protactinium-234	0.1306		0.135	0.136		0.0997	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Radium-226	-0.1398	U	0.158	0.159	0.200	0.200	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Radium-228	-0.01402	U	0.196	0.196		0.106	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Thallium-208	0.02269	U	0.0468	0.0469		0.0238	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Thorium 228	-0.02147	U	0.0874	0.0874		0.0713	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Thorium-232	-0.01402	U	0.196	0.196		0.106	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Thorium-234	-1.148	U	0.774	0.785		0.780	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Uranium-235	-0.01931	U	0.164	0.164		0.253	pCi/g	11/24/20 14:25	12/15/20 06:01	1
Uranium-238	-1.148	U	0.774	0.785		0.780	pCi/g	11/24/20 14:25	12/15/20 06:01	1

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-490107/2-A

Matrix: Solid

Analysis Batch: 491760

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490107

Analyte	Spike Added	LCS		Total Uncert.		LOQ	DLC	Unit	%Rec	%Rec. Limits
		Result	Qual	(2σ+/-)						
Americium-241	96.4	98.74		10.4			0.556	pCi/g	102	87 - 116
Cesium-137	26.7	26.80		2.86	0.0700	0.0977	pCi/g		100	87 - 120
Cobalt-60	9.46	9.108		0.964			0.0312	pCi/g	96	87 - 115

Lab Sample ID: 160-40475-2 DU

Matrix: Solid

Analysis Batch: 491756

Client Sample ID: HPPG-ESU-TU079A-002

Prep Type: Total/NA

Prep Batch: 490107

Analyte	Sample	Sample	DU		Total		LOQ	DLC	Unit	RER	Limit
	Result	Qual	Result	Qual	Uncert.	(2σ+/-)					
Actinium 228	0.703		0.3399		0.232			0.113	pCi/g	0.83	1
Actinium-227	0.199	U	-0.3039	U	0.635			0.365	pCi/g	0.49	1
Bismuth-212	1.06		0.3699	U	0.817			0.637	pCi/g	0.54	1
Bismuth-214	0.491		0.3066		0.145			0.0668	pCi/g	0.66	1
Cesium-137	-0.0295	U	0.03606	U	0.0677	0.0700	0.0522	pCi/g	0.50	1	
Lead-210	-0.573	U	-0.8409	U	1.31			1.35	pCi/g	0.08	1
Lead-212	0.498		0.4350		0.117			0.0565	pCi/g	0.28	1
Lead-214	0.484		0.4433		0.124			0.0574	pCi/g	0.17	1
Potassium-40	8.45		8.978		1.76			0.257	pCi/g	0.15	1
Protactinium-231	0.000	U	0.0000	U	0.508			2.25	pCi/g	0	1
Protactinium-234	0.116	U	-0.1102	U	0.309			0.251	pCi/g	0.37	1
Radium-226	0.491		0.3066		0.145	0.200	0.0668	pCi/g	0.66	1	
Radium-228	0.703		0.3399		0.232			0.113	pCi/g	0.83	1
Thallium-208	0.203		0.1134		0.0837			0.0382	pCi/g	0.63	1
Thorium 228	0.498		0.4350		0.117			0.0565	pCi/g	0.28	1
Thorium-232	0.703		0.3399		0.232			0.113	pCi/g	0.83	1
Thorium-234	0.505		-0.03492	U	1.28			1.05	pCi/g	0.29	1
Uranium-235	0.0116	U	0.2119	U	0.338			0.339	pCi/g	0.57	1
Uranium-238	0.505		-0.03492	U	1.28			1.05	pCi/g	0.29	1

Lab Sample ID: MB 160-490110/1-A

Matrix: Solid

Analysis Batch: 491760

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490110

Analyte	MB	MB	Count	Total		LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert.	(2σ+/-)	(2σ+/-)						
Actinium 228	-0.07398	U	0.147	0.147			0.116	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Actinium-227	0.2114	U	0.407	0.407			0.252	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Bismuth-212	-0.3557	U	0.675	0.676			0.645	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Bismuth-214	0.06911	U	0.206	0.206			0.180	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Cesium-137	0.02001	U	0.0430	0.0431	0.0700	0.0322	pCi/g		11/24/20 15:38	12/15/20 09:10	1
Lead-210	0.1000	U	1.38	1.38			0.974	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Lead-212	-0.08007	U	0.0728	0.0735			0.103	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Lead-214	-0.01904	U	0.0567	0.0567			0.106	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Potassium-40	-0.01550	U	0.839	0.839			0.507	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Protactinium-231	0.1119	U	0.426	0.426			1.91	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Protactinium-234	-0.01452	U	0.0477	0.0477			0.133	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Radium-226	0.06911	U	0.206	0.206	0.200	0.180	pCi/g		11/24/20 15:38	12/15/20 09:10	1

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-490110/1-A

Matrix: Solid

Analysis Batch: 491760

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490110

Analyte	Result	MB	MB	Count		Total		DLC	Unit	Prepared	Analyzed	Dil Fac
				Uncert.	(2σ+/-)	Uncert.	(2σ+/-)					
Radium-228	-0.07398	U		0.147		0.147		0.116	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Thallium-208	0.04196			0.0344		0.0346		0.0186	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Thorium 228	-0.08007	U		0.0728		0.0735		0.103	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Thorium-232	-0.07398	U		0.147		0.147		0.116	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Thorium-234	0.3007	U		0.531		0.532		0.345	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Uranium-235	0.1443	U		0.215		0.216		0.196	pCi/g	11/24/20 15:38	12/15/20 09:10	1
Uranium-238	0.3007	U		0.531		0.532		0.345	pCi/g	11/24/20 15:38	12/15/20 09:10	1

Lab Sample ID: LCS 160-490110/2-A

Matrix: Solid

Analysis Batch: 491761

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490110

Analyte	Spike Added	LCS Result	LCS Qual	Total			DLC	Unit	%Rec	Limits	%Rec.
				Uncert.	(2σ+/-)	LOQ					
Americium-241	96.4	97.83		10.3			0.637	pCi/g	101	87 - 116	
Cesium-137	26.7	26.25		2.84		0.0700	0.103	pCi/g	98	87 - 120	
Cobalt-60	9.46	9.316		1.01			0.0424	pCi/g	98	87 - 115	

Lab Sample ID: 160-40475-22 DU

Matrix: Solid

Analysis Batch: 491761

Client Sample ID: HPPG-ESU-TU079A-022

Prep Type: Total/NA

Prep Batch: 490110

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total			DLC	Unit	RER	Limit
					Uncert.	(2σ+/-)	LOQ				
Actinium 228	0.530		0.5347		0.168			0.0434	pCi/g	0.01	1
Actinium-227	-0.0304	U	0.1588	U	0.463			0.414	pCi/g	0.33	1
Bismuth-212	0.196	U	0.03488	U	0.930			0.762	pCi/g	0.1	1
Bismuth-214	0.159	U	0.3198		0.145			0.0763	pCi/g	0.68	1
Cesium-137	-0.00374	U	-0.02038	U	0.0873		0.0700	0.0449	pCi/g	0.12	1
Lead-210	0.203	U	-0.4988	U	1.49			1.08	pCi/g	0.25	1
Lead-212	0.530		0.5610		0.132			0.0444	pCi/g	0.12	1
Lead-214	0.498		0.2434		0.137			0.123	pCi/g	0.98	1
Potassium-40	6.66		8.302		1.83			0.296	pCi/g	0.51	1
Protactinium-231	-0.760	U	0.0000	U	0.702			2.24	pCi/g	0.22	1
Protactinium-234	-0.00672	U	0.09230	U	0.166			0.219	pCi/g	0.54	1
Radium-226	0.159	U	0.3198		0.145			0.0763	pCi/g	0.68	1
Radium-228	0.530		0.5347		0.168			0.0434	pCi/g	0.01	1
Thallium-208	0.147		0.1758		0.0797			0.0334	pCi/g	0.20	1
Thorium 228	0.530		0.5610		0.132			0.0444	pCi/g	0.12	1
Thorium-232	0.530		0.5347		0.168			0.0434	pCi/g	0.01	1
Thorium-234	-0.711	U	-0.8096	U	0.612			0.883	pCi/g	0.07	1
Uranium-235	0.0945	U	0.05823	U	0.195			0.302	pCi/g	0.09	1
Uranium-238	-0.711	U	-0.8096	U	0.612			0.883	pCi/g	0.07	1

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-490116/1-A

Matrix: Solid

Analysis Batch: 491758

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 490116

Analyte	MB	MB	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.1584		0.120	0.121		0.0480	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Actinium-227	0.2511	U	0.302	0.303		0.325	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Bismuth-212	0.3500	U	0.660	0.661		0.481	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Bismuth-214	-0.06406	U	0.190	0.190		0.203	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Cesium-137	-0.005535	U	0.0687	0.0687	0.0700	0.0387	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Lead-210	-1.521	U	2.11	2.12		1.81	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Lead-212	0.005502	U	0.107	0.107		0.0876	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Lead-214	-0.08636	U	0.192	0.193		0.147	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Potassium-40	0.3126	U	0.611	0.612		0.424	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Protactinium-231	-1.133	U	4.20	4.20		3.42	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Protactinium-234	0.04721	U	0.191	0.191		0.251	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Radium-226	-0.06406	U	0.190	0.190	0.200	0.203	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Radium-228	0.1584		0.120	0.121		0.0480	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Thallium-208	0.03896	U	0.0360	0.0363		0.0547	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Thorium 228	0.005502	U	0.107	0.107		0.0876	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Thorium-232	0.1584		0.120	0.121		0.0480	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Thorium-234	-1.226	U	0.929	0.941		0.986	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Uranium-235	0.1090	U	0.221	0.221		0.429	pCi/g	11/24/20 16:52	12/15/20 10:54	1
Uranium-238	-1.226	U	0.929	0.941		0.986	pCi/g	11/24/20 16:52	12/15/20 10:54	1

Lab Sample ID: LCS 160-490116/2-A

Matrix: Solid

Analysis Batch: 491754

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 490116

Analyte	Spike	LCS	LCS	Total	Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec	Limits
	Added	Result	Qual	(2σ+/-)						
Americium-241	96.4	92.92		9.74			0.467	pCi/g	96	87 - 116
Cesium-137	26.7	25.62		2.72	0.0700		0.0853	pCi/g	96	87 - 120
Cobalt-60	9.46	8.667		0.912			0.0389	pCi/g	92	87 - 115

Eurofins TestAmerica, St. Louis

QC Association Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Rad

Leach Batch: 489758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	Dry and Grind	
160-40475-2	HPPG-ESU-TU079A-002	Total/NA	Solid	Dry and Grind	
160-40475-3	HPPG-ESU-TU079A-003	Total/NA	Solid	Dry and Grind	
160-40475-4	HPPG-ESU-TU079A-004	Total/NA	Solid	Dry and Grind	
160-40475-5	HPPG-ESU-TU079A-005	Total/NA	Solid	Dry and Grind	
160-40475-6	HPPG-ESU-TU079A-006	Total/NA	Solid	Dry and Grind	
160-40475-2 DU	HPPG-ESU-TU079A-002	Total/NA	Solid	Dry and Grind	

Leach Batch: 489763

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-7	HPPG-ESU-TU079A-007	Total/NA	Solid	Dry and Grind	
160-40475-8	HPPG-ESU-TU079A-008	Total/NA	Solid	Dry and Grind	
160-40475-9	HPPG-ESU-TU079A-009	Total/NA	Solid	Dry and Grind	
160-40475-10	HPPG-ESU-TU079A-010	Total/NA	Solid	Dry and Grind	
160-40475-11	HPPG-ESU-TU079A-011	Total/NA	Solid	Dry and Grind	
160-40475-12	HPPG-ESU-TU079A-012	Total/NA	Solid	Dry and Grind	
160-40475-13	HPPG-ESU-TU079A-013	Total/NA	Solid	Dry and Grind	
160-40475-14	HPPG-ESU-TU079A-014	Total/NA	Solid	Dry and Grind	
160-40475-15	HPPG-ESU-TU079A-015	Total/NA	Solid	Dry and Grind	
160-40475-16	HPPG-ESU-TU079A-016	Total/NA	Solid	Dry and Grind	
160-40475-17	HPPG-ESU-TU079A-017	Total/NA	Solid	Dry and Grind	
160-40475-18	HPPG-ESU-TU079A-018	Total/NA	Solid	Dry and Grind	
160-40475-19	HPPG-ESU-TU079A-019	Total/NA	Solid	Dry and Grind	
160-40475-20	HPPG-ESU-TU079A-020	Total/NA	Solid	Dry and Grind	
160-40475-21	HPPG-ESU-TU079A-021	Total/NA	Solid	Dry and Grind	
160-40475-22	HPPG-ESU-TU079A-022	Total/NA	Solid	Dry and Grind	
160-40475-23	HPPG-ESU-TU079A-023	Total/NA	Solid	Dry and Grind	
160-40475-24	HPPG-ESU-TU079A-024	Total/NA	Solid	Dry and Grind	
160-40475-25	HPPG-ESU-TU079A-025	Total/NA	Solid	Dry and Grind	
160-40475-26	HPPG-F-039	Total/NA	Solid	Dry and Grind	
160-40475-27	HPPG-F-040	Total/NA	Solid	Dry and Grind	
160-40475-22 DU	HPPG-ESU-TU079A-022	Total/NA	Solid	Dry and Grind	

Prep Batch: 490107

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	Fill_Geo-21	489758
160-40475-2	HPPG-ESU-TU079A-002	Total/NA	Solid	Fill_Geo-21	489758
MB 160-490107/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-490107/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-40475-2 DU	HPPG-ESU-TU079A-002	Total/NA	Solid	Fill_Geo-21	489758

Prep Batch: 490110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-3	HPPG-ESU-TU079A-003	Total/NA	Solid	Fill_Geo-21	489758
160-40475-4	HPPG-ESU-TU079A-004	Total/NA	Solid	Fill_Geo-21	489758
160-40475-5	HPPG-ESU-TU079A-005	Total/NA	Solid	Fill_Geo-21	489758
160-40475-6	HPPG-ESU-TU079A-006	Total/NA	Solid	Fill_Geo-21	489758
160-40475-7	HPPG-ESU-TU079A-007	Total/NA	Solid	Fill_Geo-21	489763
160-40475-8	HPPG-ESU-TU079A-008	Total/NA	Solid	Fill_Geo-21	489763
160-40475-9	HPPG-ESU-TU079A-009	Total/NA	Solid	Fill_Geo-21	489763
160-40475-10	HPPG-ESU-TU079A-010	Total/NA	Solid	Fill_Geo-21	489763

Eurofins TestAmerica, St. Louis

QC Association Summary

Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
 SDG: GJ46599769

Rad (Continued)

Prep Batch: 490110 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-11	HPPG-ESU-TU079A-011	Total/NA	Solid	Fill_Geo-21	489763
160-40475-12	HPPG-ESU-TU079A-012	Total/NA	Solid	Fill_Geo-21	489763
160-40475-13	HPPG-ESU-TU079A-013	Total/NA	Solid	Fill_Geo-21	489763
160-40475-14	HPPG-ESU-TU079A-014	Total/NA	Solid	Fill_Geo-21	489763
160-40475-15	HPPG-ESU-TU079A-015	Total/NA	Solid	Fill_Geo-21	489763
160-40475-16	HPPG-ESU-TU079A-016	Total/NA	Solid	Fill_Geo-21	489763
160-40475-17	HPPG-ESU-TU079A-017	Total/NA	Solid	Fill_Geo-21	489763
160-40475-18	HPPG-ESU-TU079A-018	Total/NA	Solid	Fill_Geo-21	489763
160-40475-19	HPPG-ESU-TU079A-019	Total/NA	Solid	Fill_Geo-21	489763
160-40475-20	HPPG-ESU-TU079A-020	Total/NA	Solid	Fill_Geo-21	489763
160-40475-21	HPPG-ESU-TU079A-021	Total/NA	Solid	Fill_Geo-21	489763
160-40475-22	HPPG-ESU-TU079A-022	Total/NA	Solid	Fill_Geo-21	489763
MB 160-490110/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-490110/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-40475-22 DU	HPPG-ESU-TU079A-022	Total/NA	Solid	Fill_Geo-21	489763

Prep Batch: 490116

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-23	HPPG-ESU-TU079A-023	Total/NA	Solid	Fill_Geo-21	489763
160-40475-24	HPPG-ESU-TU079A-024	Total/NA	Solid	Fill_Geo-21	489763
160-40475-25	HPPG-ESU-TU079A-025	Total/NA	Solid	Fill_Geo-21	489763
160-40475-26	HPPG-F-039	Total/NA	Solid	Fill_Geo-21	489763
160-40475-27	HPPG-F-040	Total/NA	Solid	Fill_Geo-21	489763
MB 160-490116/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-490116/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 490603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-40475-1	HPPG-ESU-TU079A-001	Total/NA	Solid	DPS-7	489758
160-40475-10	HPPG-ESU-TU079A-010	Total/NA	Solid	DPS-7	489763
160-40475-21	HPPG-ESU-TU079A-021	Total/NA	Solid	DPS-7	489763
MB 160-490603/21-A	Method Blank	Total/NA	Solid	DPS-7	
LCS 160-490603/1-A	Lab Control Sample	Total/NA	Solid	DPS-7	

Eurofins TestAmerica, St. Louis

Tracer/Carrier Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40475-1
SDG: GJ46599769

Method: 905 - Strontium-90 (GFPC)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Sr (40-110)	Y (40-110)
160-40475-1	HPPG-ESU-TU079A-001	95.3	93.5
160-40475-10	HPPG-ESU-TU079A-010	101	92.0
160-40475-21	HPPG-ESU-TU079A-021	105	91.2
LCS 160-490603/1-A	Lab Control Sample	107	90.8
MB 160-490603/21-A	Method Blank	83.7	87.1

Tracer/Carrier Legend

Sr = Sr Carrier

Y = Y Carrier